



**CALIFORNIA STATE SCIENCE FAIR  
2017 PROJECT SUMMARY**

<b>Name(s)</b> Andee L. Poole	<b>Project Number</b> <b>S2314</b>
<b>Project Title</b> <b>Identifying and Investigating the Effects of a Biological Agent in Alfalfa on Darkling Beetles</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The objective of this study is to determine a biological agent within alfalfa that potentially attracts Darkling beetles, which are in the same family as Blister beetles. Due to their lethal toxin, the blister beetles cause serious concerns in the Midwest and Southern regions of the United States where they live. By determining if there is a factor within the alfalfa that attracts the beetles, that factor could be eliminated.</p> <p><b>Methods/Materials</b> 10 Darkling beetles, choice chamber, filter paper, samples of alfalfa at various stages in development and harvest. Place the desired sample of alfalfa on one side of the chamber, and leave the other side as an empty control. Place five beetles in each side of the chamber, and count the number of beetles in each side every minute, thus testing beetle preference to the various samples of alfalfa.</p> <p><b>Results</b> The data collected for beetle preference was analyzed through the use of a Chi squared test. The test was calculated between beetle preference for the control chamber and beetle preference for the particular alfalfa sample. Then those numbers were compared to critical values for a 95% confidence interval and to each other, and it was determined that beetles prefer dry mature leaves and stems over fresh immature leaves and stems and dry immature shoots.</p> <p><b>Conclusions/Discussion</b> Darkling beetle attraction to dry mature leaves and stems indicates that there is a change that occurs in the alfalfa plants as they grow and mature until they are old enough to be harvested. As alfalfa plants mature, the amounts of lignin within those plants increases because it is an organic compound that provides structural support for the plant. The amount of pectin, another organic compound, is also abnormally high in alfalfa plants when compared to other forages. This being said, it is likely that beetle attraction is due to the amounts of lignin and pectin within the alfalfa plants.</p>	
<b>Summary Statement</b> I tested the preference of Darkling beetles to alfalfa plants at various stages of development to determine if there is a biological agent in the plants that attracts those beetles.	
<b>Help Received</b> My AP biology teacher helped to design the experiment and read my papers.	